PRECISION ENGINEERING

Index to Volume 11, 1989

No 1 January 1–60
No 2 April 61–124
No 3 July 125–188
No 4 October 189–256

Articles

1 A unique machine for grinding large, off-axis optical components: the OAGM 2500, *P. B. Leadbeater, M. Clarke, W. J. Wills-Moren* 191

2 An automatic calibration system for angular encoders, *T. Masuda, M. Kajitani* 95

3 Computer vision based station for tool setting and tool form measurement, *T. D. Doiron* 231

4 Cutting mechanism of fine ceramics with a single point diamond, *T. Nakajima, Y. Uno, T. Fujiwara* 19

5 Development and implementation of a high speed open loop control technique for micro-positioning of mechanical structures, *H. Ozisik, R. F. Keltie* 225

6 Diode lasers for interferometry, *A. Abou-Zeid* 139

7 Dynamic compensation technology of the spindle error motion of a precision lathe, *M. Q. Chen, C. H. Yang* 135

8 Dynamic position measurement technique for flash-on-the-fly wafer exposure, *J. T. M. Stevenson, J. R. Jordan* 127

9 Experimental investigation of shape changes in electrochemical micromachining through photoresist masks, *E. Rosset, D. Landolt* 79

10 Investigation into the effects of waviness present on the cam surface profile of an engine camshaft, *R. F. O'Connor, T. A. Spedding* 83

11 In-process measurement and a workpiece-referred form accuracy control system (WORFAC): concept of the method of the preliminary experiment, *T. Kohno, Y. Okazaki, N. Ozawa, K. Mitui, M. Omoda* 9

12 Magnetic field-assisted polishing – application to a curved surface, *H. Suzuki, S. Kodera, S. Hara, H. Matsunaga, T. Kurobe* 197

13 Materials classification for fine mechanics, *D. G. Chetwynd* 203

14 Measurement of the geometric features of a cutting tool edge with the aid of a digital image processing technique, *Y. Maeda, H. Uchida, A. Yamamoto* 165

15 Non-catastrophic failure of the laser transducer system in a universal measuring machine, *C. F. Pace* 239

16 Precision thread grinding using a laser feedback system, *J. Otsuka* 89

17 Scope of in-process measurement, monitoring and control techniques in machining processes – Part 2: In-process techniques for workpieces, *M. Shiraishi* 27

18 Scope of in-process measurement, monitoring and control techniques in machining processes – Part 3: In-process techniques for cutting processes and machine tools, *M. Shiraishi* 39

19 Spherical coordinate automatic measurement (SCAM) system for robots' end-point sensing, *N. Vira* 151

20 Spherical shape measurements using subaperture optical testing techniques, *R. D. Day, G. N. Lawrence* 3

21 State-of-the-art non-destructive measurement of sub-surface material properties and damagers, *E. Brinksmeier* 211

22 Trench depth measurement method for wafer patterning, *K. Takada, J. Noda* 145

23 Ultrasonic superposition vibration cutting of ceramics, *J. Kumabe, K. Fuchizawa, T. Soutome, Y. Nishimoto* 71

24 Use of gratings and periodic structures as alignment targets on wafer steppers, *J. T. M. Stevenson, J. R. Jordan* 63

PRECISION ENGINEERING

Index to Volume 11, 1989

No 1 January 1–60
No 2 April 61–124
No 3 July 125–188
No 4 October 189–256

Articles

1 A unique machine for grinding large, off-axis optical components: the OAGM 2500, *P. B. Leadbeater, M. Clarke, W. J. Wills-Moren* 191

2 An automatic calibration system for angular encoders, *T. Masuda, M. Kajitani* 95

3 Computer vision based station for tool setting and tool form measurement, *T. D. Doiron* 231

4 Cutting mechanism of fine ceramics with a single point diamond, *T. Nakajima, Y. Uno, T. Fujiwara* 19

5 Development and implementation of a high speed open loop control technique for micro-positioning of mechanical structures, *H. Ozisik, R. F. Keltie* 225

6 Diode lasers for interferometry, *A. Abou-Zeid* 139

7 Dynamic compensation technology of the spindle error motion of a precision lathe, *M. Q. Chen, C. H. Yang* 135

8 Dynamic position measurement technique for flash-on-the-fly wafer exposure, *J. T. M. Stevenson, J. R. Jordan* 127

9 Experimental investigation of shape changes in electrochemical micromachining through photoresist masks, *E. Rosset, D. Landolt* 79

10 Investigation into the effects of waviness present on the cam surface profile of an engine camshaft, *R. F. O'Connor, T. A. Spedding* 83

11 In-process measurement and a workpiece-referred form accuracy control system (WORFAC): concept of the method of the preliminary experiment, *T. Kohno, Y. Okazaki, N. Ozawa, K. Mitui, M. Omoda* 9

12 Magnetic field-assisted polishing – application to a curved surface, *H. Suzuki, S. Kodera, S. Hara, H. Matsunaga, T. Kurobe* 197

13 Materials classification for fine mechanics, *D. G. Chetwynd* 203

14 Measurement of the geometric features of a cutting tool edge with the aid of a digital image processing technique, *Y. Maeda, H. Uchida, A. Yamamoto* 165

15 Non-catastrophic failure of the laser transducer system in a universal measuring machine, *C. F. Pace* 239

16 Precision thread grinding using a laser feedback system, *J. Otsuka* 89

17 Scope of in-process measurement, monitoring and control techniques in machining processes – Part 2: In-process techniques for workpieces, *M. Shiraishi* 27

18 Scope of in-process measurement, monitoring and control techniques in machining processes – Part 3: In-process techniques for cutting processes and machine tools, *M. Shiraishi* 39

19 Spherical coordinate automatic measurement (SCAM) system for robots' end-point sensing, *N. Vira* 151

20 Spherical shape measurements using subaperture optical testing techniques, *R. D. Day, G. N. Lawrence* 3

21 State-of-the-art non-destructive measurement of sub-surface material properties and damagers, *E. Brinksmeier* 211

22 Trench depth measurement method for wafer patterning, *K. Takada, J. Noda* 145

23 Ultrasonic superposition vibration cutting of ceramics, *J. Kumabe, K. Fuchizawa, T. Soutome, Y. Nishimoto* 71

24 Use of gratings and periodic structures as alignment targets on wafer steppers, *J. T. M. Stevenson, J. R. Jordan* 63

Authors

(Number refers to article number)

Abou-Zeid, A. **6**
Brinksmeier, E. **21**
Chen, M. Q. **7**
Chetwynd, D. G. **13**
Clarke, M. **1**
Day, R. D. **20**
Doiron, T. D. **3**
Fuchizawa, K. **23**
Fujiwara, T. **4**
Hara, S. **12**
Jordan, J. R. **8, 24**
Kajitani, M. **2**
Keltie, R. F. **5**
Kodera, S. **12**
Kohno, T. **11**
Kumabe, J. **23**
Kurobe, T. **12**
Landolt, D. **9**
Lawrence, G. N. **20**
Leadbeater, P. B. **1**
Maeda, Y. **14**
Masuda, T. **2**
Matsunaga, H. **12**
Mitui, K. **11**
Nakajima, T. **4**
Nishimoto, Y. **23**
Noda, J. **22**
Okazaki, Y. **11**
Omoda, M. **11**
Otsuka, J. **16**
Ozawa, N. **11**
Ozisik, H. **5**
O'Connor, R. F. **10**
Pace, C.F. **15**
Rosset, E. **9**
Shiraishi, M. **17, 18**
Soutome, T. **23**
Spedding, T. A. **10**
Stevenson, J. T. M. **8, 24**
Suzuki, H. **12**
Takada, K. **22**
Uchida, H. **14**
Uno, Y. **4**
Vira, N. **19**
Wills-Moren, W. J. **1**
Yamamoto, A. **14**
Yang, C. H. **7**

Keywords

(Number refers to article number)

air bearings, **1**
alignment, **24**
angle measurements, **2**
angular encoders, **2, 19**
automatic calibration, **2**
cams, **10**
ceramics, **4, 23**
chatter, **18**
chemical milling, **9**
circular cutting, **4**
control systems, **5, 11**
coordinate measuring machines, **15**
curved surfaces, **12**
cutting, **14, 18**
diamond cutting, **4**
diamond-turned surfaces, **12**
digital image processing, **14**
dimensional measurements, **17**
diode lasers, **6**
dynamic compensation, **7**
edge determination, **3**
electrochemical micromachining, **9**
etching, **8**
flash-on-the-fly operation, **8**
form accuracy, **11**
glass mirror, **1**
gratings, **24**
grinding, **1, 16**
groove generation, **4**
interference, **22**
interferometry, **6**
in-process control, **16**
in-process measurement, **11, 17, 18**
laser feedback systems, **16**
laser interferometer, **1**
laser transducer systems, **15**
leadscrews, **16**
lithium niobate, **12**

Reprints

Reprints of all articles in this journal are available in quantities of 100 or more

Reprints are essential–

- for the company that wants to distribute impartial comment on its activities to potential customers and clients
- for the company that wants to up-date its technical staff on new techniques and new technologies
- for the company that wants to publicize its research and development work
- for the training course organizer who wants to assemble key reading material for his students
- for the university or technical college lecturer who wants to distribute the latest information on a topic under study

For full details of prices and availability of reprints, please write to

The Reprint Department
Butterworth Scientific Limited
PO Box 63 Westbury House Bury Street
Guildford Surrey GU2 5BH England

machine tools, **18**
machining, **3**
magnetic field-assisted polishing, **12**
materials properties, **13**
mechanical structures, **5**
metrology, **6**
metrology frames, **1**
micropositioning, **5**
micro-indentation techniques, **21**
moiré fringes, **24**
non-catastrophic failure, **15**
non-destructive measurement, **21**
off-axis optics, **1**
oil retention, **10**
open loop control, **5**
optical section method, **14**
photoresists, **9**
piezoelectric actuators, **7**
pitch accuracy, **16**
position measurement, **8**
precision machine design, **13**
precision spheres, **20**
Raman spectroscopy, **21**
robot positioning, **19**
roundness errors, **7**
scanning acoustic microscopy, **21**
silicon wafers, **22**
spectral properties, **6**
spherical coordinate automatic measurement, **19, 20**
spindle error motion, **7**
sub-aperture optical testing, **20**
sub-surface damage, **21**
surface roughness, **10, 17**
temperature control, **18**
tool edge geometry, **14**
tool wear, **14**
tool-setting, **3**
trench depth measurement, **22**
turning, **11**
ultrasonic machining, **23**
vibration cutting, **23**
vision gauging, **3**
wafer alignment, **8**
wafer steppers, **24**
waviness, **11**
wear, **10, 14**
x-rays, **21**

Precis

News

Anti-backlash lead screws have low drag torque 180
Bench-top CMM has moving-bridge design 246
Company for precision prototyping and manufacturing 245
Company offers specialist engineering facilities 106
Desk-top system for measuring roundness 172
Electron-beam writers have high-speed and high-resolution 251
Gauges for cylindrical component measurement 104
Guide to ball and roller bearing lubrication 245
High-speed linear drive for precision balltrack 104
Integral bearing units 58
Interferometer for gauge block calibration 52
Interferometer increases accuracy on laser transducer systems 104
Interferometry goes into the ultra-violet region 57
Ion guns for surface engineering 56
Ion implantation system for surface modification 180
Lapping machine for surface flatness of 0.29 μm 181
Laser microscope brochure 58
Linear positioning stage for small spaces 172
Machine attachments can improve surface quality 178
Manufacture of artificial polycrystal diamonds 52
Measurement of motion errors 56
Measurement system for critical dimensions 57
Measuring centre has optical and mechanical probing 106
Mechanical relaxation of residual stresses 53
Metrology centre is intended as industrial resource 251
Microprocessor controlled cutting machine 180
Micro-actuator developed for precision positioning 53
Mike Downs joins editorial board 51
Motor driven stage for use in restricted space applications 108
NBS becomes NIST 53
New glass works being built in Japan will produce 'super flat' glass 173
NIST guide 175
Non-contact system for measuring wire diameters 178
NRR measuring system 175
Optical micrometer for on-line measurement 248
Optical probe for surface texture measurement 248
Optical tables and isolation systems described 57
Point range sensors 246
Polishing technique developed for non-spherical surfaces 244
Positioning stages have low profiles 51
Precision metrology catalogue 102
Pressurized air bearing has extremely high stiffness 110
Project to improve quantitative surface analysis 246
RHEED microscope developed for crystal structure analysis 251
Roundness measurement system is computer controlled 50
Seeded gel abrasives keep sharper during grinding processes 242
SEM has enhancement system for image comparison 179
Six-axis positioning system has a modular design 108
Software package for long scan surface profiler 102
Software programme for EDM 101
Spindle error analyser is computer based 178
STM has built-in SEM 250
Stylus surface roughness system for flat surface 244
Surface contamination detector for 0.2 μm particles 173
Surface profiler uses diamond stylus 172
Surface profiling system has autofocusing 179
Survey of precision linear displacement techniques 103
System evaluates cylinder bore form and distortion 102
System for measuring wear on diamond honing sticks 250
System gauges bores during machining 107
System to monitor accuracy of disc to drive shafts 175
Tapered roller bearings have an asynchronous run-out of 0.5 μm 101
Testing diamond and CBN grinding wheels 103
Thin positioning tables 51
Tool design program 52
Travelling bridge CMM 181
Triggering probe has integrated interface electronics 103
Universal counters for linear scales 180
User's guide to statistical process control is available free 242
Vertical and bridge-type machining centres launched 174
Vibration isolators 56
Wire electron discharge machine for small diamond tools 200
Wire diameter measurements 56

Conference Reports

International Technical Symposium on Optical and Optoelectronic Applied Science and Engineering, 14–19 August 1988, San Diego, California, USA, 48
The American Society for Precision Engineering Spring Conference on Sub-Surface Damage in Glass, 25–27 April 1989, Tucson, Arizona, USA, 182
The International Congress on Optical Science and Engineering, 19–23 September 1988, Hamburg, FRG, 114
Third annual meeting of the American Society for Precision Engineering (ASPE), 24–27 October 1988, Atlanta, Georgia, USA, 117